

WE CLAIM:

1. A method of reducing binding of a microorganism to a surface, comprising enzymatically modifying an adhesin on the microorganism.

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2. The method of claim 1, wherein enzymatically modifying comprises contacting the microorganism with a polyphenol oxidase, an asparaginase, or a combination thereof.

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3. The method of claim 1, wherein the microorganism comprises a prokaryote, a eukaryote, a virus, or a combination thereof.

4. The method of claim 3, wherein the prokaryote comprises a gram-positive bacterium, a gram-negative bacterium, or a combination thereof.

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5. The method of claim 3, wherein the prokaryote comprises a *Staphylococcus*.

6. The method of claim 3, wherein the eukaryote comprises a fungus or protozoan.

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7. The method of claim 6, wherein the fungus comprises a *Candida*.

8. The method of claim 1, wherein the adhesin comprises a lectin.

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9. A method of reducing adhesion by a microorganism, comprising exposing the microorganism to an effective amount of an enzyme which reduces adhesion by a microorganism.

10. The method of claim 9, wherein the enzyme catalyzes a reaction for modifying a molecule on the microorganism.

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11. The method of claim 9, wherein the enzyme catalyzes modification of a side chain of an amino acid.

5 12. ~~The method of claim 11, wherein the amino acid is found in the binding site of an adhesin.~~

13. The method of claim 11, wherein the amino acid comprises asparagine, tyrosine, or a combination thereof.

10 14. The method of claim 9, wherein the enzyme modifies a carbohydrate binding site on the microorganism.

15 15. The method of claim 12, wherein a lectin comprises the carbohydrate binding site.

16. The method of claim 9, wherein the enzyme comprises a polyphenol oxidase, an asparaginase, or a combination thereof.

20 17. The method of claim 9, wherein the microorganism comprises a prokaryote, a eukaryote, a virus, or a combination thereof.

18. The method of claim 17, wherein the prokaryote comprises a gram-positive bacterium, a gram-negative bacterium, or a combination thereof.

25 19. The method of claim 18, wherein the prokaryote comprises a *Staphylococcus*.

20. The method of claim 17, wherein the eukaryote comprises a fungus or protozoan.

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21. The method of claim 20, wherein the fungus comprises a *Candida*.

~~22. A method of treating an animal, comprising administering to the animal an effective amount of an enzyme which reduces adhesion by a microorganism to the animal's cells or tissues.~~

23. The method of claim 22, wherein the enzyme comprises a polyphenol oxidase, an asparaginase, or a combination thereof.

10 24. The method of claim 22, wherein the microorganism comprises a prokaryote, a eukaryote, a virus, or a combination thereof.

25. The method of claim 24, wherein the prokaryote comprises a gram-positive bacterium, a gram-negative bacterium, or a combination thereof.

15 26. The method of claim 24, wherein the prokaryote comprises a *Staphylococcus*.

27. The method of claim 24, wherein the eukaryote comprises a fungus or a protozoan.

20 28. The method of claim 27, wherein the fungus comprises a *Candida*.

29. The method of claim 22, wherein administering the enzyme comprises oral or topical administration.

25 30. The method of claim 29, wherein administering the enzyme comprises topical administration to a nasal tissue.

30 31. The method of claim 29, wherein administering the enzyme comprises oral administration to a digestive tissue.

32. The method of claim 31, wherein the oral administration to the digestive tissue comprises administering a sustained release formulation or an enteric formulation.

5 — 33. An oral care composition comprising an effective amount of an enzyme which reduces adhesion by a microorganism.

34. The oral care composition of claim 33, wherein the enzyme comprises a polyphenol oxidase, an asparaginase, or a combination thereof.

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35. The oral care composition of claim 33, wherein the microorganism comprises a prokaryote, a eukaryote, a virus, or a combination thereof.

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36. The oral care composition of claim 35, wherein the prokaryote comprises a gram-positive bacterium, a gram-negative bacterium, a protozoan, or a combination thereof.

37. The oral care composition of claim 35, wherein the prokaryote comprises a *Staphylococcus*.

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38. The oral care composition of claim 35, wherein the eukaryote comprises a fungus or protozoan.

39. The oral care composition of claim 33, further comprising a buffer, a peroxide, a source of copper ion, an oxygen generating compound, or a combination thereof.

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40. The oral care composition of claim 33, wherein the oral care composition comprises a mouthwash, a toothpaste, an implant, or a combination thereof.

41. The oral care composition of claim 33, wherein the oral care composition
30 comprises a solid, a semi-solid, or a liquid composition.

42. A method for reducing adhesion by a microorganism to oral tissues or cells, comprising exposing the oral tissues or cells to an oral care composition comprising an effective amount of an enzyme which reduces adhesion by a microorganism.

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43. The method of claim 42, wherein the oral care composition comprises a mouthwash, a toothpaste, an implant, or a combination thereof.

44. A method for reducing adhesion by a microorganism to a dental prosthesis, comprising exposing the dental prosthesis to an oral care composition comprising an effective amount of an enzyme which reduces adhesion by a microorganism.

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45. The method of claim 44, wherein the dental prosthesis comprises a denture.

46. A method of making an oral composition useful for reducing adhesion by a microorganism, comprising the step of adding to an oral composition an effective amount of an enzyme which reduces adhesion by a microorganism.

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47. A pharmaceutical composition comprising an effective amount of polyphenol oxidase which reduces adhesion by a microorganism and a pharmaceutically acceptable carrier.

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48. The pharmaceutical composition of claim 47, wherein the polyphenol oxidase comprises polyphenol oxidase isolated from a microorganism or plant.

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49. The pharmaceutical composition of claim 47, wherein the microorganism or plant comprises a thermophilic microorganism, a thermophilic fungus, or a mushroom.

50. The pharmaceutical composition of claim 47, wherein the polyphenol oxidase comprises recombinant polyphenol oxidase.

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